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14839/US Hz/hr

CLAIMS (as amended during Chapter II procedure)

1. A microsystem (20) adapted for dielectrophoretic manipulation of particles (30, 30a, 30b) in a suspension liquid in a channel (21, 211, 212) and an electrode arrangement (10) with at least one microelectrode (11, 11a-e, 12, 41a-f, 47, 51a, 51b, 511b, 512b, 61a-e, 612a, 71a, 71b, 711a) on a lateral wall (21a, 21b, 23) of the channel for generating a field barrier which crosses the channel at least partly;
**characterised in that**
in relation to the direction of flow in the channel, the microelectrode has a predetermined constant curvature or comprises a multitude of straight electrode sections with predetermined angles in relation to the direction of flow so that the field barrier has a predetermined curvature relative to the direction of flow.

2. The microsystem according to claim 1, in which the electrode arrangement comprises at least two microelectrodes (11, 12) of the same shape and alignment affixed on opposite channel walls, said microelectrodes being in the shape of a curved band.

3. The microsystem according to claim 2, in which the microelectrodes (11a-e, 41a-f) depending on the flow profile are curved such that in every section of the field barrier of the microelectrode the resulting force acting on a particle points to a region which is situated upstream in relation to the microelectrode.

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4. The microsystem according to claim 3, in which four microelectrodes (11a-e) are arranged as focussing electrodes to form a particle funnel.

5. The microsystem according to claim 2, in which the microelectrodes (11a-e, 41a-f) depending on the flow profile are curved such that the resulting force acting on a particle from one end of the microelectrode towards the other end describes a change in direction, which leads from a direction in a region situated downstream in relation to the microelectrode, to a direction in a region situated upstream in relation to the microelectrode.

6. The microsystem according to claim 5, in which two microelectrodes (11a-e, 41a-f) are provided as sorting electrodes whose field barrier acts in combination with the flow profile of the suspension liquid in the channel such that suspended particles with different passive electrical characteristics can pass the sorting electrodes on separate tracks depending on their characteristics.

7. The microsystem according to claim 2, in which on opposite channel walls at least two microelectrodes (61a-e, 611a-e, 612a, 71a, 71b, 711a) of the same shape and alignment are provided, each comprising an angle section closed in downstream direction.

8. The microsystem according to claim 7, in which the microelectrodes act in combination as collector electrodes (61a-e, 611a-e, 612a, 71a, 71b, 711a).

9. The microsystem according to claim 7 or 8, in which one group of collector electrodes (61a-e, 611a-e, 612a, 71a, 71b, 711a) is arranged in cross direction of the channel.

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10. The microsystem according to one of the preceding claims, in which the microelectrodes are arranged in pairs on the bottom and cover surfaces of the channel.

11. The microsystem according to claim 1, in which two microelectrodes are provided on two opposite channel walls, comprising different geometric shapes.

12. The microsystem according to claim 11, in which the cross-sectional shape of the channel is rectangular and the microelectrodes are attached to the narrower lateral surfaces and comprise an area-shaped microelectrode on one lateral surface and a band-shaped microelectrode on the opposite lateral surface.

13. The microsystem according to claim 12, in which the area-shaped microelectrode (91) is arranged so as to be floating.

14. The microsystem according to claim 12 or 13, in which the channel (21) is divided into two sub-channels (211, 212) by a separation wall, with the separation wall comprising an aperture (232) in the region of the microelectrodes arranged on the opposite side.

15. The microsystem according to claim 1, in which three microelectrodes are provided of which two microelectrodes are arranged as focussing electrodes (41a-d) in the form of band-shaped electrodes converging on a middle line, on the bottom and cover surfaces of the channel, and the third microelectrode is arranged as a field-forming auxiliary electrode (47) spaced apart from the bottom and cover surfaces in the middle of the channel.

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16. The microsystem according to claim 15, in which the channel (211, 212) is divided into two sub-channels by a separation wall (231) with an aperture upstream in relation to the auxiliary electrode (103).

17. The microsystem according to claim 1, in which on one channel wall a cuboid collecting electrode (121) with a multitude of reservoirs (121a) is arranged which acts in combination with a deflection electrode (122) on the opposite channel wall for deflecting particles (30) into the reservoirs (121a).

18. The microsystem according to claim 1, in which on one channel wall (21a) a multitude of cuboid partial electrodes (111) spaced apart from each other are provided, which electrode arrangement comprises a deflection electrode (112) arranged at the opposite channel wall so as to deflect particles (30b) into the spaces between the cuboid partial electrodes (111).

19. The use of a microsystem according to one of claims 1 to 18 for deflecting, sorting, collecting and/or forming microscopic particles.

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